

April 2003

AIR FORCE MATERIEL COMMAND  
**LEADING  
EDGE**

*Located at Wright-Patterson Air Force Base, Ohio, Huffman Prairie, where the Wright brothers flew almost 100 years ago, is one of the largest tallgrass prairie remnants in Ohio. The prairie's 109 acres serve as home today to 184 catalogued native and non-native plant species, and to a number of endangered and threatened species. It's not uncommon to see an early morning mist over the prairie, as shown here. Wright-Patterson's Office of Environmental Management has been overseeing the base's legacy assets for more than a decade, in collaboration with base and local community members and organizations.*

**AFMC: Putting people  
in an environmental  
frame of mind**



# LEADING EDGE

Headquarters  
Air Force Materiel Command  
Wright-Patterson Air Force Base,  
Ohio

Commander  
Gen. Lester Lyles

Director of Public Affairs  
Col. Donna Pastor

Chief, Internal Communication  
Capt. Dave Smith

Executive Editor  
Ms. Libby Van Hook

Managing Editor  
2nd Lt. Gailyn Whitman

Department of Defense  
Thomas Jefferson Awards  
First Place, Magazine Format,  
1996  
Second Place, 1998, 1997, 1995

Air Force Media Awards  
First Place, Magazine Format,  
1998, 1997, 1996, 1995, 1994  
Second Place, 2000, 1993, 1992  
Third Place, 2001, 1999



This funded Air Force magazine is an authorized publication published monthly for the people of the Air Force Materiel Command. Contents of LEADING EDGE are not necessarily the official views of, or endorsed by, the U.S. Government, the Department of Defense or the Department of the Air Force. The editorial content is edited, prepared and provided by the Public Affairs Office of Headquarters Air Force Materiel Command, 4375 Chidlaw Rd., RM N152, Wright-Patterson AFB, Ohio 45433-5006. The magazine can be found on the Internet on AFMCPA's home page: [http://www.afmc-pub.wpafb.af.mil/HQ-AFMCPA/leading\\_edge/index.htm](http://www.afmc-pub.wpafb.af.mil/HQ-AFMCPA/leading_edge/index.htm). Photographs are official U.S. Air Force photos unless otherwise indicated. Distribution ratio is 8:1. For submission and writers' guidelines, contact the editor at the above address or DSN 787-7602 or (937)257-1203. Send email to: [LeadingEdge@wpafb.af.mil](mailto:LeadingEdge@wpafb.af.mil).



## Cover stories

### 4 — 15 Putting people in an environmental frame of mind

**B**uilding on the four environmental pillars of restoration, conservation, pollution prevention and compliance, the civil engineering community is formally in charge of protecting the environment on Air Force sites. They rely, however, on each one of us to keep the future in mind while restoring what years of environmental unconcern had brought, and to build prevention into ongoing programs. Turn the page to see how far we've come in our journey.



Cover design by Ms. Libby VanHook, Executive Editor.  
Cover photo of Huffman Prairie by Mr. Henry Narducci, Jr., WPAFB, Ohio.

## Mission Progress

- 17 Testing bombs with 'brains'
- 18 Getting ready for deployment becomes easier

## Features

- 19 AFMC and AFGE — forging a dynamic partnership
- 20 Strategic Sourcing: Improving the supply chain
- 21 A farewell befitting Ringo

## Departments Briefs

- 3 Mission Briefs
- 16 News Briefs
- 22 People
- 26 Awards



Read how AFMC and AFGE are forging a dynamic new partnership to provide support to our American warfighters on page 19.

Correction: In the February 2003 issue the story on Page 6, "AF battles shortages of scientists, engineers," was written by Staff Sgt. A.J. Bosker, AFNEWS, with contributions by 2nd Lt. Tony Wickman, AFFTC Public Affairs. The photo on page 23 was of Mr. Rodgerick Newhouse, Edwards AFB, Calif., and not of Dr. Edmund Moore, AFRL.

## Information Directorate can see through walls



### Experimental micro-sat XSS-10 launch successful

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — Air Force Research Laboratory's first on-orbit experimental micro-satellite successfully launched into space Jan. 29 from Cape Canaveral Air Force Station, Fla., and began feeding real-time results to ground control Jan. 30.

XSS-10 team members initiated a primary mission pass and ejected the XSS-10 from the second stage of the Delta II rocket.

This mission called for the XSS-10 to acquire and track the second stage, then perform three intervals of inspection maneuvers at varying distances as it circles the Earth.

Scientists are now studying images and data beamed from the XSS-10's space-to-ground link system.

— Reported by AFRL Public Affairs  
(Courtesy photo)

ROME, N.Y. — Engineers at the Air Force Research Laboratory Information Directorate are pursuing technologies to allow military peacekeepers and law enforcement personnel to monitor individuals concealed in buildings.

The directorate recently awarded a contract to Time Domain Corp. of Huntsville, Ala., to produce a portable device capable of detecting human motion behind a wall. The 12-month contract is funded by the Army Night Vision

Laboratory at Fort Belvoir, Va., in support of its enhanced through-the-wall surveillance for military operations in urbanized terrain program. The portable sensor, scheduled for delivery next fall, will be capable of detecting the movement of a human body up to 30 feet behind a standard interior wall.

— Reported by AFRL Public Affairs

### AEDC completes electric propulsion test in 12V

ARNOLD AIR FORCE BASE, Tenn. — The Space Test and Research Team here recently completed a commercial electric propulsion test in one of the center's space simulation chambers. During the test, the test chamber reached record low temperatures and vacuum pressures during thruster firings and confirmed viability of the chambers enhancements.

This was the first commercial electric propulsion test completed in the newly upgraded thermal vacuum chamber. The upgrades were part of a 10-year agreement between AEDC and Lockheed Martin to accomplish research and development testing of Lockheed Martin electric propulsion systems here.

— Reported by AEDC Public Affairs

### B-52 launches avionics midlife improvements

EDWARDS AIR FORCE BASE, Calif. — After three years of test planning, Air Force flight test experts here successfully introduced a new offensive avionics system for the B-52 to the rigors of flight.

Flight testing of the B-52 Avionics Midlife Improvement began in mid-December and is scheduled to continue through March 2004. The program is specifically designed to upgrade the B-52H offensive avionics system and includes replacing the inertial navigation system, the avionics control unit, the data transfer system and all associated hardware and software.

— Reported by AFFTC Public Affairs

### Air Force develops new telemetry capabilities

EDWARDS AIR FORCE BASE, Calif. — The Air Force Flight Test Center's program management and engineering direc-

torates here recently developed a new aeronautical telemetry capability. The program is designed to ensure Defense Department test and training ranges have necessary radio frequency spectrum needed to accomplish mission requirements.

The advanced range telemetry program is a joint service modernization program sponsored by the Office of the Secretary of Defense, Director of operational test and evaluation, central test and evaluation investment program, and was conceived to improve the efficiency, quality, utility and availability of Defense Department aeronautical telemetry spectrum.

In order to accomplish this, the program implemented a new, state-of-the-art telemetry transmitter called Feher Quadrature Phase Shift Keying. This technological advancement is expected to accelerate systems acquisition flight testing and will provide streamlined deployments to the warfighter. It is also expected to reduce increased testing costs associated with limited telemetry spectrum.

— Reported by AFFTC Public Affairs

### AFRL/EPA sign homeland security agreement

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — The Air Force Research Laboratory and U.S. Environmental Protection Agency recently combined forces for future homeland security research efforts.

Maj. Gen. Paul Nielsen, AFRL Commander, and Mr. E. Timothy Oppelt, EPA National Homeland Security Research Center director, signed a Memorandum of Understanding in February to perform collaborative research projects to provide new technologies for homeland security.

Per the agreement, AFRL will provide: annual discussion to identify additional areas of concern related to homeland security; formulate and establish guidance that outlines specific joint projects; provide funding for research; assign key personnel; work jointly to address research and development needs of a third party; assign administrative points of contact and technical leads; and generate an annual report on progress made under this MOU.

— Reported by AFRL Public Affairs



# AFMC covers ground on environmental journey

**Brig. Gen. David Cannan**  
Command Civil Engineer

The Air Force Materiel Command environmental protection program is the largest and most complex in the Air Force. Because of the dedicated efforts of hundreds of talented professionals throughout AFMC, we've made great progress. However, much remains to be done.

While the civil engineering community is formally in charge of protecting the environment on Air Force sites, it's never been a task we could complete alone. And, thanks to the work of pretty much everyone in Air Force Materiel Command, we've made tremendous strides with establishing an "environmental" frame of mind.

## A long road

It hasn't been an easy road; we essentially started on this journey with an enormous amount of ground to cover. Not only did we have to begin cleaning up what years of unconcern had bought us, but we also had to simultaneously build prevention into ongoing and future programs.

This was a brand-new mindset for all of us. When I came into the Air Force in 1971, there was no environmental protection program. Nobody had ever heard of it, we didn't think about it, and the processes were not in place to make it easy for us to be environmentally responsible, even if we had thought of it.

*Left: A depression, a temporary or permanent pond fed through ground or rainwater and used by amphibians as breeding grounds, located at Eglin AFB, Fla. See Pages 6 & 7 for a more complete explanation of wetlands. (Photo by Ms. Brenda Herring, AAC)*

For instance, if you needed just a pint of something we'd now consider a hazardous material, back then you often couldn't even order that small an amount. The system would force you to buy a 55-gallon drum of it.

Then, after you'd used a few ounces, you had to figure out how to get rid of the rest, and there was no HAZMAT program to help you out. That's just one example of the kind of institutional barriers we had to identify and remedy.

## A painful journey

Today, though, I think we've reached the point where environmental protection has been institutionalized; it's just something we do. It wasn't necessarily a painless journey, nor has it been a cheap one.

But, like safety, it's not just the right thing to do; it's the right business thing to. It's easy to see that prevention is so much cheaper than clean-up — that fundamental fact forces us to think three-dimensionally with respect to time. We have to keep the past, present and future always in our minds when we work just about anything.

The past is certainly with us in this undertaking to protect the environment; in fact, it's the first of the four "pillars" of environmental protection, in the form of restoration.

This command has spent \$1.41 billion dollars since the mid-1980s to clean up and restore sites of past pollution. The good news is that we're progressing much quicker than expected and will have all final cleanup remedies in place by 2008, a full six years ahead of Defense Department goals!

## Following a path

The present is on our minds, too, and is represented by the second and third pillars: compliance and conservation. We

take care of compliance by, first, making sure we're aware of and understand all the relevant laws and statutes. Then, we head out and follow them, doing the required impact analyses and conforming to the laws.

Conservation is an important part of our mission, as well. We try to be good stewards of the immense amount of federal land entrusted to our use, doing our best to preserve the natural, cultural and historical resources and artifacts in our safekeeping.

## Traveling forward

In fact, AFMC bases have done such a good job on the conservation side that our units have won numerous awards in the past five years, including:

❑ 2001 Air Force Cultural Resources Management Award for Eglin.

❑ 2001 Air Force Honorable Mention, Natural Resource Conservation Award at Robins.

❑ 2000 Air Force Natural Resource Conservation Award at Eglin.

❑ 1999 Air Force Natural Resources Conservation Award at Robins.

❑ 1998 Air Force Natural Resources Management at Eglin.

❑ 1998 Air Force and Defense Department Cultural Resources Management, Individual Award, Ms. Janet Ferguson, Wright-Patterson AFB, Ohio.

❑ 1998 Air Force Honorable Mention, Natural Resources Management Award at Robins.

❑ 1998 Air Force Honorable Mention, Natural Resources Management, Individual Award, Mr. Robert Sargent, Robins.

❑ 1997 Air Force Natural Resources Management Award



*Brig. Gen. David Cannan, Command Civil Engineer, said that everyone in Air Force Materiel Command has helped to make strides in environmental restoration and preservation.*

at Robins.

❑ 1997 National Arbor Day Foundation Award at Eglin.

## Future connections

Finally, our fourth pillar, pollution prevention, is our connection to the future. Preventing pollution is so much cheaper, easier and smarter than having to clean it up afterwards. It pays back in so many different ways that we'd be foolish to ignore it.

For instance, pollution prevention can be as simple as finding alternatives to the hazardous materials we may be accustomed to using.

By finding alternatives, we're not only reducing future restoration costs, but we're also realizing immediate benefits: our people are working in less-dangerous environments, possibly even exchanging

bulky, uncomfortable HAZMAT suits for regular coveralls. That fact alone saves time and increases productivity.

The workers are also less likely to become sick or injured on the job, so we're saving not just money, but protecting them better and, incidentally, reducing possible future liability from health-care costs.

## The bottom line?

Preventing pollution is much smarter than waiting to clean it up later. Upfront investment in our environment pays itself off many times in the future.

Our challenge now is to not lose momentum or become complacent. We can't afford to lose our focus, and we depend on everyone at every level of every AFMC center to continue to move out and keep the future in mind every day.



# Wetlands

*The mission of national defense at Eglin Air Force Base, Fla., has served the country well for more than 60 years. One of the little-known benefactors of that mission is Eglin's natural resources and wetlands.*

Wetlands are areas that are soaked or flooded by surface or ground-water frequently enough, or for sufficient duration, to support a unique assemblage of plants, birds, animals and aquatic life. Of Florida's 11 million acres of wetlands, 62,809 are on the Eglin Reservation.

The Natural Resources program ensures continued mission access to Eglin's land and airspace by managing the base's natural resources through three branches; forestry, fire and wildlife. Wetlands impact each of these branches, so they work together to preserve and monitor these areas.

Although wetlands have long been regarded as mosquito-ridden wastelands, these diamonds in the rough are invaluable, according to Mr. Bruce Hagedorn, natural resources branch endangered species biologist. "Wetlands provide habitat for amphibians, fish and other wildlife," he said. "They act as filters to cleanse water of impurities, recharge water supplies, reduce flood risks and provide recreational opportunities."

He said wetlands are nurseries for many plants and animals and are extremely beneficial to amphibians, such as frogs, salamanders and toads that live in wetlands during part of their life cycle, and they attract birds for nesting. Migrating birds use wetlands during their journeys.

In fact, the U.S. Fish and Wildlife Service estimates that up to 43 percent of federally threatened and endangered species rely on wetlands for their survival. "Eglin's wetlands contain many rare species including state and federally listed threatened and endangered species, some that can not be found anywhere else in the world," said Mr. Kevin Hiers, natural resource branch ecological monitoring coordinator. Ecological monitoring collects data about the composition and functions of wetlands and the species that live there.

Eglin has 11 federally listed species and 64 stated listed species; 51 of those are plants. A few of the species of these are the flatwoods salamander and Okaloosa darter, a small fish only found in Eglin's streams.

Although not a listed species, the Florida bog frog is just as rare. This small, yellow-green frog was discovered on Eglin in 1982 and lives nowhere else in the world.

Another extraordinary find is the rare assortment of carnivorous plants such as the threatened hooded pitcher plant that dominates some of Eglin's swamps and seepage slopes. Seepage slopes are wet meadows on hillsides created by groundwater seepage.

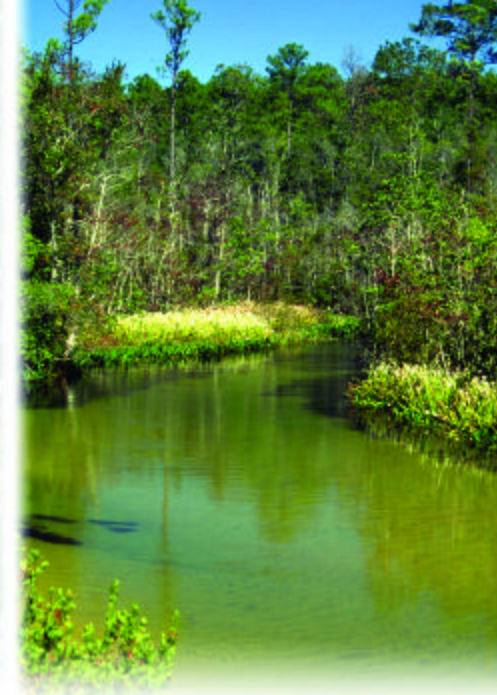
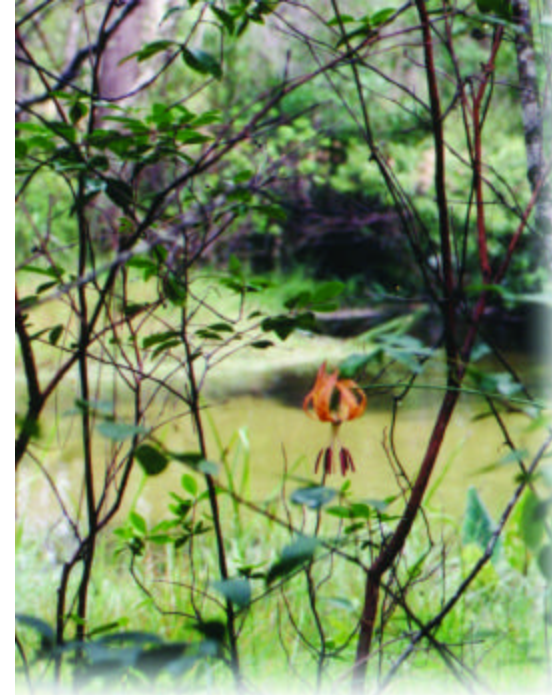
"By protecting these rare wetland areas and the unique species that depend on these areas, we ensure the sustainability of the mission here at Eglin," said Col. Michael Newberry, environmental management director.

"Maintaining both our national defense capability to develop, test and evaluate conventional munitions and our environmental quality is essential to Eglin's success," he said.

According to the United States Environmental Protection Agency, more than 220 million acres of wetlands once existed in the lower 48 states in the 1600s. Today, only 100 million acres remain. Despite state and federal laws that protect wetlands, the United States loses 60,000 acres a year to commercial and agricultural development. As the northwest Florida coastline continues to be developed, Eglin's wetlands are becoming a rarity and as unique as the Eglin mission.

— Ms. Marnee Carlson, AAC Environmental Public Affairs

*Eglin AFB, Fla., has 11 federally listed species and 64 state listed species; 51 of those are plants. The threatened hooded pitcher plant shown here dominates some of Eglin's swamps and seepage slopes. (Photo by Ms. Brenda Herring, AAC)*



*Left: Baygalls shade streams and maintain healthy water temperatures for plants and animals at Eglin AFB, Fla. Middle: Steephead-origin streams draining into the Bay aid the endangered Okaloosa Darter, found only on Eglin. Right: Seepage slopes are home to several rare carnivorous plants, such as the hooded pitcher plants. (Photos by Ms. Brenda Herring, AAC)*

## Wetlands: Nature's unique, diverse areas

**Ms. Marnee Carlson**  
Eglin AFB, Fla., Environmental  
Public Affairs

While the common link between wetlands may be water, not all wetlands are the same.

"When we think of wetlands, we think of swamps, but wetlands are a complicated system because there are so many types of wetlands," said Mr. Kevin Hiers, natural resource branch ecological monitoring coordinator at Eglin Air Force Base, Fla.

Eglin has five types of wetlands: seepage slopes, steepheads, baygalls, depressions and flood plains.

### Seepage Slopes

According to Mr. Hiers, Eglin's seepage slopes are rare habitats; there are 136 on Eglin and these areas have the highest biodiversity per square meter in the world.

"There are 60 species per square meter, you don't even get that in the tropics," he said.

Seepage slopes are wet meadows on hillsides created by groundwater seepage. They serve as home to several rare carnivorous plants, such as the hooded pitcher plants and sundews.

### Steepheads

Another unique find on Eglin are steepheads. These deep ravines are the points where small streams begin.

As the groundwater emerges it washes away the sandy soils, creating an amphitheater shaped canyon, often 50 to 100 feet deep and 1,000 feet wide.

On the Eglin reservation, several steephead-origin streams draining into Choctawhatchee Bay contain the entire distribution of the endangered Okaloosa Darter, a small fish found nowhere else in the world.

### Depressions

For amphibians looking for breeding grounds, depressions are a safe haven.

Depressions are temporary or permanent ponds fed through ground or rainwater. At least 10 of Florida's 27 species of native frogs rely on these ponds.

"Depressions are extremely important for amphibians," said Mr. Hiers. "They are primary breeding grounds because there are no fish in these ponds that can eat the juveniles eggs and tadpoles."

### Baygalls

Baygalls are forested swamps with spongy soil, which is made up of thick layers of decomposed plant matter.

According to Mr. Bruce Hagedorn, natural resources branch endangered species biologist, baygalls are important because they shade streams and keep the water temperatures at a degree beneficial for stream plants and animals.

### Floodplains

More common, but equally as important are floodplains. There are 42,372 acres of floodplains on Eglin.

These swampy areas are in the floodplains of major rivers, such as the Yellow River, that hugs the Eglin Reservation's Northwest border.

These areas are subject to seasonal flooding, but are not wet all year.

Floodplains include floodplain swamps, floodplain forests, bottomland forests and freshwater tidal swamps.

According to Mr. Hagedorn, floodplains are the highway system for many species to include the state listed Florida black bear and migrating birds.

"Black bears use these corridors to move from place to place as well as to forage for food," he said. "Migrating birds use wetlands to rest and feed during their cross-continental journeys."



# AFRL fuels research aids mother nature

Translating decades of technological progress into advances that promise greater warfighter capability is something researchers accomplish here every day in the Air Force Research Laboratory's Propulsion Directorate.

And while they're not specifically focused on helping Mother Nature, many of the 1,000-plus scientists, engineers and technicians routinely take the lead in the testing of environmentally friendly technologies that are a lot less damaging to the world around us.

## Clean Fuels

Whether it's testing and advancing "ultra-clean" fuels in partnership with the Department of Energy, or evaluating new batteries that eliminate environmentally hazardous materials like cadmium and lead, the Air Force Research Laboratory's experts on propulsion and power are producing significant so-called "green" side effects.

One area showing great promise is the directorate's collaboration with the National Energy Technology Laboratory on the study of alternative non-petroleum-based fuels.

## New fuel sources

As part of the Energy Department's ultra-clean transportation fuels initiative, the propulsion directorate fuels branch and the University of Dayton Research Institute are studying the feasibility of using aviation fuels produced catalytically from hydrogen and carbon monoxide created from non-petroleum sources (coal and natural gas).

The result is a fuel with very low levels of impurities compared to what is found in current aviation fuels, said Dr. Tim Edwards, fuels branch chemical engineer. "Ongoing in-house testing of combustion emissions has confirmed expectations these fuels will have lower soot emissions than the current JP-8 jet fuel."

The joint effort with the Air Force is part of a larger Energy Department initiative that could commit \$100 million or

more over five years to provide the nation with affordable, clean transportation fuels from petroleum, natural gas, coal and other energy resources, said Mr. John Winslow, NETL's transportation fuels and chemicals manager

## Fueling the future

The ultimate goal of the initiative is to develop and deploy technologies producing ultra-clean burning transportation fuels for the 21st century from both petroleum and non-petroleum resources.

The propulsion directorate is uniquely qualified to assist in these efforts because of their advanced fuels testing facilities, managed as the

National Aerospace Fuels Research Complex, said Mr. William Harrison, fuels branch chief.

In addition to supporting the warfighter with performance-enhancing fuels and additives to reduce Uncle Sam's bottom line, the directorate's fuels complex collaborates with industry and academia to test high performance, cost-effective aerospace fuels and additives for the commercial industry, Mr. Harrison said.



*Ms. Barbara Harruff, Capt. Michelle Rauch, Ph.D., and Dr. Christopher Bunker, AFRL researchers, discuss the potential applications of advanced additives for fuel chemistry modification.*

Cleaner burning fuels aren't the only advancements being made to cut down on potentially harmful emissions. More efficient turbine engines that reduce engine emissions without sacrificing enhanced performance for the warfighter are also being built and tested.

"Innovative gas turbine combustor technologies are being tested and developed today to increase engine performance while reducing exhaust emissions," said Mr. Mel Roquomore, a senior research scientist. "Trapped vortex combustion, or TVC, is one such technology with the potential to revolutionize turbine engine performance.

"The TVC concept is a revolutionary technology with potential payoffs in almost every category of gas turbine combustor performance including operability, weight and even cost," he explained.

"The most substantial change over conventional engines is a mechanism that stabilizes the combustor flame," Mr.

Roquomore pointed out.

## Improving combustion

"TVC stabilizes the flame by mechanically trapping a vortex, or whirlpool, of combustion gases in cavities located in the walls of the combustor. These vortices recirculate the hot combustion gases within the cavity improving combustion efficiency and reducing emissions," he said.

— Mr. Michael Kelly, AFRL Propulsion Directorate



# Analyze this!

*When it leaks, spills or can't be identified, BEAL chemists get analytical*

When late one Friday a discolored fuel sample led F/A-22 maintenance workers at Edwards Air Force Base, Calif., to suspect a fuel-system leak, they turned to the Base Environmental Analytical Laboratory for help.

The crew needed to know if the reddish-orange tinge they saw was related to leaking hydraulic fluid. If it was, they needed to isolate the source and repair the leak. Less than six hours later BEAL provided an answer that led maintenance personnel straight to the source.

"By giving us a way to isolate the problem, BEAL allowed us to expedite the mission," said Mr. Wayne Burt, ground operations engineer on the F/A-22 testing program. "It was sure going after that and we were able to proceed without an extensive maintenance effort."

There are other labs on base that handle chemical samples, but BEAL is the only lab available to the Air Force Flight Test Center that is capable of the kind of sophisticated analysis it takes to pinpoint chemicals with scientific certainty, said Mr. Robert Wood, director of environmental management at Edwards.

"It's something like the difference between a gas station and full-service repair shop," Mr. Wood said. "When you need to put some air in your tires or check your oil, a gas station will do. But when you need to find out why your car won't run or is running poorly, you go to the full-service shop. For AFFTC personnel, that would be BEAL."

## All in a day's work

Analyzing chemical samples and finding answers for the world's most advanced test programs is all part of the

At Edwards AFB, Calif., Mr. David Arokiasmy, BEAL chemist, loads a tray with environmental samples to be analyzed. (AFFTC photo)

day's work at BEAL.

The test program for the F/A-22 has been ongoing at the AFFTC since 1998. The F/A-22's combination of super-cruise, post-stall maneuvering and low observable technology coupled with first-look, first-kill capability is unequaled by any aircraft in the world now or foreseen for the future.

"That's a lot of fighter!" Mr. Wood said. "And BEAL is a lot of lab."

But few may be utilizing the service provided at BEAL because they aren't aware it exists. The chemical laboratory work done by BEAL can answer a lot of fairly common questions, such as:

- ☐ *Do I have to fix this pump or not?*
- ☐ *Which barrel do you want this hazardous waste in?*
- ☐ *Are my seals leaking?*
- ☐ *Is it flammable? Is it corrosive?*
- ☐ *Is this stuff a health hazard?*

BEAL has been a fixture at Edwards since 1989. It has supported environmental programs on base and is focused on hazardous waste, or Resource Conservation and Recovery Act analysis.

Currently, the lab handles mostly long-term monitoring and volatile analysis down to parts per billion levels of volatile organic compounds and metals. The lab is state-certified in several methods to perform both chemical analysis and physical characteristic testing.

## Program support

Support for environmental efforts may be the most common service provided by BEAL but it is not the only program that can be supported.

In September 2002,

Conforming Storage Facility personnel delivered a sample to BEAL from an on-base tenant. Immediate analysis was required to determine whether the sample was a jet fuel, or a mixture of other materials.

"The sample was processed on a rush basis," said Mr. Cat McDonald, storage facility manager. It was determined that the sample was jet fuel, the results were reported to the facility the same day.

## Identifying customers

With capability like this, the lab is considering what can be done to expand its services to include support in the areas of air and water quality. The first step will be to identify customers on base who want to use the service.

"Beyond the quick-turn-around and familiarity of lab personnel with activities at Edwards, what's really valuable about an on-base chemical laboratory is the consulting services the experienced staff can provide," said Mr. McDonald. "Not everyone can interpret a lab report. But when I go to BEAL, I can ask the people in the lab who did it and they tell me exactly what I need to know."

An experienced staff, proximity to customers, and focus on service are just some of the reasons on-base organizations might want to take environmental samples to BEAL, said Mr. Wood. "We are hoping that as the word gets out others who are not familiar with BEAL will let us know about their needs and how we might be able to serve them."

For more information on BEAL, contact Edwards Environmental Management at (661) 277-1401.

— Ms. Darlene Tefft Norwood, AFFTC



# Recycling, wigglers help WPAFB protect environment

Wright-Patterson Air Force Base, located 10 miles northeast of Dayton, Ohio, hosts some of the nation’s most important military procurement, logistics and research and development organizations. In addition to hundreds of shops and laboratories, the base operates and maintains two active runways averaging 38,000 arrivals and departures annually. The more than 8,000 acres and 22,000 employees, along with the sheer number and diversity of processes performed on base, make it a unique installation in terms of the types of items used and the wastes generated from its activities.

“Given the magnitude and variety of types of waste produced,” said Mr. Ron Lester, director of environmental management, “we are continually looking for creative ways not only to minimize the amount of waste, but to recycle whenever possible in order to reduce the quantity of waste that has to be hauled off for disposal in landfills. “While our immediate goal is to ensure base compliance with the Defense Department, Air Force and Air Force Materiel Command diversion rate for non-hazardous waste — 40 percent by the

end of fiscal year 2005,” he said, “our long-range goal is a sustainable development program through which we continue to grow with no net environmental burden.” Below are but two examples of innovative diversion of solid waste into usable products at Wright-Patterson.

## Recycling the west ramp

It can be a daunting task. The airfield’s west ramp replacement in 2002 was a \$21 million project. A number of innovative measures were taken to minimize environmental impact as well as generate cost savings. For example, the use of fly ash, some of which was generated from Wright-Patterson’s two coal-fired heating plants, to replace 35 percent of the cement in the concrete mixture, resulted in a savings of approximately \$300,000. Also, 180 tons of metal from blast fences and drain grates were recycled and 14,400 tons of asphalt were sent to a local quarry plant for use as recycled asphalt pavement. “However, by far the most spectacular achievement was the reuse of 81,940 tons

of concrete from the old ramp as the base material for the new west ramp — literally recycling the old ramp into the new one,” said Mr. Raymond Baker, affirmative procurement program manager. This material was crushed on site and used as fill for a savings of \$2.4 million in disposal fees. And since it was not necessary to purchase new aggregate material, a cost avoidance of \$1.4 million was also realized. In addition, these efforts raised the base’s solid waste diversion rate to more than 90 percent — well above the 40 percent goal!

## Red wigglers reduce waste

Last summer Wright-Patterson’s recycling team acquired all the equipment needed to set up their new vermi-composting program — for the cost of transporting it, according to Mr. Bill Meinering, recycling program manager. Since then, more than 300,000 worms — California red wigglers, to be precise — have been conscientiously converting approximately 500 pounds of solid waste a day into nutrient-rich fertilizer. This process closes the circle from food waste to natural fertilizer. The vermi-composter came with a shredder, which the recycling center staff uses to convert the vegetable waste from Wright-Patterson’s commissary, in combination with equal amounts of newsprint, into “dinner” for the worms. “When this is spread out over the surface in the afternoon, the worms come up to start their meal,” said Mr. Charles McCreary, recycling manager. The worms produce castings that are harvested through a grate in the bottom of the compartment. “Through this inventive process,” said Mr. Meinering, “the base saves almost \$10,000 a year in removal fees — and in the process creates ‘free’ fertilizer for use in maintaining the base’s landscaping.” — Ms. Susan Ferns, ASC Environmental Public Affairs

Mr. Joseph Reaves, Wright-Patterson AFB, Ohio, recycling program, scoops a handful of California red wigglers from the composter. Since last summer, Wright-Patterson has been using the worms to convert solid waste into nutrient-rich fertilizer. (WPAFB photo)

# Base installs monitoring wells to eye groundwater problems

Mr. Charles Freeman  
Hill AFB, Utah, Environmental Public Affairs

Groundwater monitoring wells are being installed as part of the continuing environmental investigations being conducted at Hill Air Force Base, Utah. The environmental restoration team at Hill is pushing ahead with the investigation plans project at a record pace at Operable Unit 12, located on the northwest side of the base.

The groundwater monitoring wells are used to track contamination in groundwater, consisting mainly of trichloroethene, better known as TCE, that was used as a cleaning solvent on-base during the 1950s to the 1980s. The TCE has moved from the disposal areas on base into the groundwater and is spreading beneath some of the surrounding cities. It is important to note, however, that it is not in the drinking water.

## New collection method

“The locations and depths of the monitoring wells are determined by evaluating chemical on site specific geology data obtained from innovative technologies,” said Mr. Mark Loucks, project manager. The chemical data is collected using a technique known as hydropunch testing that involves pushing hollow steel rods into the subsurface using a hydraulic ram. Then at multiple predetermined depths, groundwater is collected through a sample port that can be opened at the bottom of the rod. The geologic data is collected using a technique called cone penetrometer testing. A steel rod is pushed into the subsurface with hydraulic rams, and sensors located along the tip and sides of the tool record pressure and friction as it is pushed into the ground. That then translates the pressure and friction data into the geology of that location. After this preliminary testing is completed and evaluated monitoring wells are installed at the appropriate location and depth.

“The monitoring wells are sampled frequently,” Mr. Loucks said. “The main thing about the results from the samples is data enables us to create maps showing the area of contamination, track changes in contaminant concentrations, monitor the rate of contaminant movement and provides us the necessary information to design and install cleanup systems.”

## A multi-step process

“The monitoring wells are typically constructed in three steps,” said Mr. Jesse Stewart, associate hydrogeologist for Montgomery Watson Harza, the contractor doing the Operable Unit 12 investigative work for the base. “The first step involves the drilling of the hole in which the well is to be installed. The second step involves lowering the well screen and casing into the ground

through the hollow portion inside the augers. “The third step is to fill the void around the casing and screen



Contractors for Hill AFB, Utah, Environmental Management Directorate install two monitoring wells. The wells help base personnel characterize the extent of trichloroethene in the groundwater. (OO-ALC photo)

with a multi-layered mixture of sand at the bottom around the screen area, clay just above the sand and cement at the top. This multi-tiered layering process allows groundwater to enter the wells and at the same time seals them from surface contamination and limits cross contamination.

## Saving time

“The entire investigative process took about two-and-a-half years, knocking off approximately six or seven years it would have otherwise taken and saving taxpayers more than \$500 thousand in the process,” said Mr. Loucks. In addition to flexible contracts and innovative technologies, the base’s environmental restoration staff credits timely support from its restoration advisory board and city officials for being ahead of schedule on this project.





# Arnold takes ecosystem management seriously

**Mr. Philip Lorenz, III**  
Arnold AFB, Tenn., Public Affairs

**T**he trees make it hard to see the Barrens that were once a predominate ecological feature of Arnold Air Force Base, Tenn.

Although the word “barrens” brings to mind a “barren” landscape, these Barrens are quite different than that.

According to Mr. Geoffry Call, conservation biologist at the Arnold Engineering and Development Center, the Barrens here are a unique combination of grasslands and wetland areas found only on the Highland Rim region of Tennessee. Early European settlers called them “Oak Barrens” and “Pondy Woods.”

## Time takes a toll on the land

“The barrens ecosystem was once a dominant feature in Middle Tennessee,” he said. “We know that parts of the Southeast Highland Rim, including Arnold, consisted of a ‘mosaic’ of open grasslands, savannas, woodlands and upland forests that were constantly shifting.”

Over time, natural and manmade fires and the actions of animals such as bison, elk and deer disturbed and maintained this ecosystem.

“More recently, land development and fire suppression has taken a dramatic toll on this environment,” he continued. “This also includes the introduction of invasive species of plants and animals that can displace native flora and fauna.”

## A serious task

Fortunately, the Air Force takes their role as environmental stewards of lands they manage very seriously, Mr. Call said. He works with an 11-member team of scientific and administrative specialists at Arnold that coordinate and conduct the ongoing conservation program for the approximately 40,000 acres comprising the center.

*Top: Frequent fires on the Barrens landscape at Arnold AFB, Tenn., promote grasses and forbs; less frequent fires allow woody vegetation to grow with an herbaceous understory layer. Infrequent fires promote growth and development of forests. Prairies, savannas and woodlands are “phases” of the Barrens mosaic that are rarely found today.*  
*Middle: “Pondy Woods” on the northern portion of Arnold.*  
*Bottom: A photo of the restored Barrens at Arnold.*

“The base began an ecosystem management program in 1995,” Mr. Call said. “The Deputy Secretary of the Environment had issued a memo through the Defense Department mandating that ecosystem management would become the practice for managing all DOD lands.

“Arnold took a very proactive approach to implementing ecosystem management,” he said. “Among other agencies, the base started a partnership with The Nature Conservancy in 1994.”

## Forming a team to help

With the help of the conservancy, the center formed a core team of stakeholders, known as the conservation integrated process team.

“That group is our means of interacting with stakeholders for the conservation program at the base,” he said. “It includes folks from academia — the University of Tennessee, Middle Tennessee State University and Sewanee, people from state and federal agencies, and it also pulls in the National Guard, which is a major land user at Arnold.”

The Air Force has been very supportive of the conservation effort here, according to Mr. Call.

“In 1998, the integrated process team decided we needed a comprehensive, systematic way of doing conservation planning at the base,” Mr. Call said.

He and his team adapted a process developed by the nature conservancy called site conservation planning. It involves the stakeholders in all aspects

of the process, from ensuring that conservation targets are identified, realistic goals are set, all environmental threats are considered and that the strategies for meeting the goals are feasible.

“It’s an adaptive process,” he said. “We consider new scientific information as it becomes available. We continually evaluate the success of our efforts and adapt strategies based on feedback from monitoring.”

One measure of the conservation program’s success is to develop projects on which to implement and test their strategies, he said. The second measure of success is determined by the number of acres that are brought under conservation management to restore or maintain the ecosystem through specific actions.

These actions include the use of prescribed burning, invasive plant management and other methods.

## A haven for endangered species

The third measure of success is accomplished through careful monitoring of the ecosystem, including the status of rare, threatened, or endangered species, to determine the impact of the conservation efforts.

“We worked with our core team beginning in 1999 to put together the site conservation plan for Arnold. We decided to focus on overall biodiversity, emphasizing ecological systems rather than individual species.”

Besides partnering with the nature conservancy, Arnold has been active with Partners-in-Flight, using their bird conservation plan for the interior low plateaus physiographic region to identify bird conservation priorities. Restoration of the biodiversity of the Barrens is central to the conservation program. This approach addresses a multitude of threats to the barrens and protects regionally imperiled birds.

## Identifying targets

According to Mr. Call, the process of site conservation planning eventually resulted in identifying three specific ecological systems and one endangered species as focal conservation targets to protect, maintain or restore at Arnold. The three focal conservation targets include the Barrens mosaic, karst wetlands and the springs and streams.

The gray bat, which is on the Federal Endangered Species List, was included as a focal species target because they have a maternity roost in the Woods Reservoir Dam and because of their dependence on ecosystems for their continued survival.

The Barrens restoration will occur gradually over decades, but

the success of the conservation program is already evident, according to Mr. Call. Barrens restoration was initiated on a little more than 1,000 acres during the Barrens Restoration Demonstration Project, which was completed in 2001, including land around the Arnold airfield.

Several uncommon species and ecological communities are returning or recovering in those areas. For example, AEDC’s Barren’s restoration efforts have dramatically enhanced the status of Eggert’s sunflower, a species that is listed as threatened under the Endangered Species Act.

## Providing cost efficiency

The base’s cooperation with the U.S. Fish and Wildlife Service on protecting listed species through ecosystem management prevents potentially costly project delays, as witnessed during the process of reopening of the airfield.

Mr. Call cautioned that the conservation and restoration processes are not a quick fix. They are, however, components of Arnold’s ecosystem management involving proactive strategies to support mission flexibility through environmental stewardship.



*Mr. Clint Strohmeier, Arnold AFB, Tenn., biologist, pulls garlic mustard as part of the Barrens restoration process. The plant is an invasive species that disrupts native vegetation in the Barrens. (AEDC photos)*





*Biodiesel fuel is a new, more environmentally friendly way to fill the Fire Department's big vehicles at Tinker AFB, Okla. Firefighter James Hester tops off a heavy rescue vehicle with fuel delivered by Mr. Billy Jackson, base fuels. (OC-ALC photo by Ms. Margo Wright)*

# From the frying pan to the fuel tank

*New fuel makes it possible to gas up Tinker's diesel vehicles in an earth-friendly way.*

**A**domestically produced, renewable fuel that can be manufactured from vegetable oils or recycled restaurant greases was delivered to the Tinker Air Force Base, Okla., base fire department early last spring.

Base officials plan to use approximately 50,000 gallons of biodiesel fuel, or "B20," per year in all diesel vehicles on base, including fire engines. The cleaner burning, biodegradable fuel reduces emissions of some of the major contributors to air pollution such as sulfur dioxide and sulfates.

## A leader in alternative fuels

"Tinker is posturing to be the leader in alternative fuels by exceeding Executive Order goals for use of alternative fuels," said Ms. Cathy Scheirman, environmental deputy director. "We currently have the largest fleet of compressed natural gas vehicles and this is one more step for us to be the leader with another alternative fuel, biodiesel. This will put Tinker on the front line addressing three important national challenges — energy, the environment and transportation."

Tinker is the first Air Force Materiel Command base to use boidiesel fuel.

"Not only is Tinker doing the right thing and setting precedence in its decision to use biodiesel, the cleaner fuel is considered the same as an alternative fuel vehicle," said Ms. Geri Hart, chief pollution of prevention. "Every 2,250 gallons of the B20 fuel used equals credit for one alternative fueled vehicle. The high cost of purchasing newer vehicles is offset through the use of the fuel."

## Reaping the rewards

The benefits of using B20 are obvious, according to Mr. Randy Gilreath, fuels quality branch chief.

"Biodiesel has numerous benefits to the environment and the community as an alternative to petroleum diesel," he said. "It is the only alternative fuel to have completed the rigorous health effects test requirements of the clean air act."

The National Biodiesel Board study results show that biodiesel reduces cancer-causing air toxics by 75 to 90 percent when compared to its petrodiesel cousin.

## Improving safety

Mr. Gilreath said the B20 blend is safe for use in all conventional diesel engines, offers the same performance and engine durability as regular diesel fuel, is safer to handle and reduces tailpipe emissions, visible smoke and noxious fumes and odors.

"Base fuels paid one dollar per gallon for the new earth friendly fuel, thirteen cents cheaper than the current pump price for conventional diesel fuel," said Mr. Mike Tabor, fuel quality assurance evaluator.

"These costs may be lowered as production increases or if the fuel is blended with conventional diesel fuel," he said.

According to Mr. Tabor, adding the cleaner, greener fuel to Tinker's alternative fuels arsenal is just one more way to wage war on pollution.

— Mr. Brion Ockenfels, OC-ALC Public Affairs

# Today's research, development focuses on tomorrow's pollution

**W**hen it comes to the environment, Air Force Materiel Command, Wright-Patterson Air Force Base, Ohio, is working hard to complete its mission safer, better and yes — cheaper.

The environmental team located within the AFMC Logistics Environmental Office provides research and development of environmentally friendly processes for existing weapon systems.

## Coming together

According to Ms. Debora Meredith, environmental office chief, technology transition is the key, and teamwork improves the odds. "By bringing together the warfighters, process owners, depot maintainers and engineers we are better able to find a solution that works for everyone.

"Pollution prevention is smart," she said. "It reduces cost by preventing later clean-ups, and from an environmental stand point it is a smart way to protect your people. In the long run, it saves the Air Force money."

At Hill AFB, Utah, depot maintainers at the Ogden Air Logistics Center are testing a new environmentally friendly high strength steel for aircraft landing gear. The new steel was developed with a computer program and has corrosive resistant properties.

The new steel is intended to

*The AFMC Logistics Environmental Office is looking at a new steel intended to replace landing gear currently protected with a highly toxic lubricant. Here, a F-16 Fighting Falcon arrives at an undisclosed location supporting Operation Enduring Freedom. (Air Force photo by Staff. Sgt. Bennie Davis III)*

replace landing gear currently protected with cadmium, which is a highly toxic corrosion-protective lubricant. Testing will continue to ensure the steel will remain strong, said Ms. Meredith.

## Innovative ideas

The environmental office is also looking at other ways to protect aircraft landing gear.

Chromium electroplating is used to protect all parts of aircraft, from landing gear to C-130 propeller hubs. AFMC environmental specialists are partnered with many groups including the U.S. Navy to develop an alternative to chromium. According to Ms. Meredith, high velocity oxy-fuel may be the answer. This new thermal spray coating is a cost-effective alternative to hard chrome plating.

"High velocity oxy-fuel has superior coating performance and will reduce turn around time for aircraft in depot maintenance," she said. "Today's chromium electroplating takes 30 hours to apply compared to

two-hour coating process for the oxy-fuel."

The oxy-fuel also meets with regulatory standards and will decrease chromium exposure to depot employees. With aircraft needing all these protective non-corrosive coatings, cleaning components for maintenance is a challenge according to Ms. Meredith.

Currently, depots rely on chemicals to clean toxic coatings from aircraft parts. The environmental office, in conjunction with Air Force Research Laboratory's Material and Manufacturing Directorate recently developed a portable laser coating removal system.

## New processes

"The laser will reduce and eventually eliminate the use of methylene chloride to strip coatings from weapon system components," said Mr. Gerald Mongelli, a contractor with Concurrent Technologies Corporation, a partner with the environmental office.

Many of the current tech-

nologies are unable to strip specialty coatings and hard to reach areas such as 90 degree angles and complex geometries. Lower powered, portable, handheld lasers have the potential to solve these problems.

"Benefits of the laser include reduced handling, storage and worker exposure to a known carcinogenic material," he said.

## Future acquisitions

The environmental office is continually searching for ways to prevent pollution and to save the Air Force money. According to Ms. Meredith, by using the team approach to pollution prevention, everyone benefits. The technologies developed for existing weapon systems are being looked at for future weapons acquisition.

"Compliance today also means less money spent cleaning up later and that means dollars saved for civil engineers and the Air Force," she said. "Even industry is excited about the new technology and looking forward to implementing the structural changes on future material."

— 2nd Lt. Gailyn Whitman, AFMC Public Affairs







## In Rememberance

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — At Headquarters Air Force Materiel Command the flags flew at half staff during the first week of February, in honor of the seven member team lost on the Space Shuttle Columbia.

Among the seven brave astronauts lost in the catastrophic failure of the Space Shuttle Columbia Feb. 1 were two Air Force officers: Col. Rick Douglas Husband, mission commander, from Amarillo, Texas, and Lt. Col. Michael P. Anderson, payload commander, from Spokane, Wash.

— Reported by AFMC Public Affairs  
(Photo by 2nd Lt. Vince King, AFMC Public Affairs)

## AFIT offers online course on environmental issues

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — The Air Force Institute of Technology helps government employees learn how to be compliant with environmental regulations.

The institute is now offering *SYS 185 — Environmental Issues in Acquisition and Sustainment*, a Web-based course that addresses environmental requirements as they relate to the acquisition and sustainment of weapon systems.

The course is self-paced, free and is worth 40 continuous learning points toward the continuing education requirement of 80 points every two years. To register just go to <http://www.afit.edu> and click on the Virtual Schoolhouse link.

— Reported by AFIT Public Affairs

## Schools excuse absence for deploying troops' kids

ROBINS AIR FORCE BASE, Ga. — Deploying parents and their children here will have a few extra hours to spend together thanks to a plan devised by the Houston County School system and the

Robins AFB Public Affairs office.

Mr. Charles Holloway, Houston County School System superintendent, approved one day's excused absence to any child of a deploying military member.

Parents will be required to send a letter to the school when the child returns from his or her day of absence.

Due to the fact that there's no one day that can be identified for all military personnel as they will deploy on different dates, one specific day is not being set aside.

— Reported by WR-ALC Public Affairs

## Museum stage for new postage stamp unveiling

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — The U.S. Postal Service recently announced its selection of the U.S. Air Force Museum as the venue for a ceremonial first-day issue of the commemorative stamp for the 100th Anniversary of Powered Flight. The stamp is intended to honor Dayton's aviation legacy and the Air Force's national museum.

Dayton Postmaster David Ashworth recently revealed the museum as the location for a May 22 unveiling ceremony.

The stamp unveiling will serve as one of a number of major 2003 events at the museum to commemorate the Centennial of Flight.

— Reported by USAFM Public Affairs

## Support center among top software organizations

TINKER AIR FORCE BASE, Okla. — The Software Engineering Institute has rated Tinker's weapon system support center among the top 4 percent of software organizations worldwide.

The institute rates organizations on a scale from one to five using a capability maturity model. The achievement represents two years of work by the Air Force and Northrop Grumman, the prime contractor for the B-2.

The center is a part of the B-2 system program office and is responsible for all software development, integration and support on the weapon system.

Actual performance data from the software industry indicate the center had significant quality improvements and reduced costs as they attain higher Software Engineering Institute ratings.

— Reported by OC-ALC Public Affairs

# Eglin engineers test bombs with 'brains'

Determining if warheads can penetrate underground targets and detonate after counting floor levels or measuring depth was the focus of recent sled testing on a Hard Target Smart Fuze at Eglin Air Force Base, Fla.

The engineering team members, consisting of about 13 people from Eglin in a variety of technical disciplines, placed the fuze in an inert warhead on a 2,000-foot test track and sent it through walls at a speeds of 1,300-feet per second, according to Mr. DeAllen Hobbs, Air Armament Center engineer.

## Measuring up

Mr. Hobbs said the hard target smart fuze features a device that measures impact and depth of burial. When a bomb hits a floor or ceiling of the intended target, the device measures a high impact that looks similar to a seismographic recording of an earthquake. When a bomb passes through an open space or void, the device measurements are shorter and it records a void.

The fuze can be programmed to trigger detonation after a certain number of voids or impacts are counted, Mr. Hobbs said.

"If intelligence reported an adversary's biological or chemical weapons storage in an underground facility, say four floors down, then the fuze could be programmed to detonate the warhead at the fourth void it counts and limit collateral damage," he said. "If we only know how deep it is underground, then we could program it to detonate at the depth required to hit the target."

Team members conducted seven successful hard target smart fuze tests on the sled test range here to validate the fuze's design capabilities to detect layers and voids, Mr. Hobbs said.

During many of the tests, the fuze was also temperature con-

ditioned along with the warhead; two warheads were soaked at 160 Fahrenheit for 12 hours, while two were conditioned at -65 Fahrenheit for 12 hours.

In one test, engineers sent a hard target smart fuze —equipped warhead through two feet of concrete, 15 feet of air, six feet of concrete, 12 feet of air and then six feet of concrete, according to Mr. Hobbs.

## Problem solved

During the entire test series, engineers only encountered one failure which was directly related to the fuze which occurred at a low temperature. Mr. Hobbs said experts fixed the problem and retested the fuze under the same low temperature conditions in which the failure occurred to verify it.

According to Mr. Hobbs, fuzes have been used in warheads since aerial weapons were first delivered in World War I. He said designs were simple then, serving mainly as safety devices for the airmen who worked with the munitions. Later models added time delays.

"This development is a quantum leap in a fuze's ability to function," said Mr. Hobbs.

The new fuze will enter flight-testing in April, with four tests scheduled, he said. Testing is targeted for penetrator warheads such as the BLU-109 and -113. He said the fuze is projected to enter production in January 2004.

"No one has the capability this fuze provides," Mr. Hobbs said. "What's more is that we are doing this all in the same size and volume as the fuzes that were used in Vietnam, and we're having excellent results."

— Ms. Doris Johnson, AAC Public Affairs



Experts at Eglin Air Force Base, Fla., are testing the Hard Target Smart Fuze. The fuze can be programmed to detonate a warhead on specific levels in order to limit collateral damage, and is projected to enter production in January 2004. (AAC photo)



# DQS offers electronic deployment information

**A**ir Force Materiel Command experts at Wright-Patterson Air Force Base, Ohio, are testing a Web-based, user friendly software program that provides warfighters instant access to deployment information. And as a bonus, the program is expected to save the Air Force nearly \$79 million during a five-year period.

The Deployment Qualification System works through the Air Force portal and gives access to current status on prerequisites like self aid and buddy care, level one anti-terrorism, chemical warfare training, weapons qualifications and personnel health assessment dates, according to Maj. Jeff Stephan, DQS program manager.

The new program also allows warfighters to be proactive in their preparations, while saving manhours by automating administrative steps in the deployment process.

## Giving power to the people

"The system was developed as a way to empower people to get ready for deployment on their own," said Maj. Stephan, noting the self-service Web site can be accessed from a workplace computer.

"The Air and Space Expeditionary Force is our culture and deploying trained and ready airmen on time is the most important thing we do," said Gen. Lester Lyles, AFMC commander. "And yet, individuals currently have no way to check or take actions to improve their individual deployment readiness without having to burden their unit deployment manager. This tool gives individuals that opportunity."

Col. William Saunders, AFMC's e-Business chief, said the system came about as a result of a business case analysis the AFMC chief information officer sponsored in February 2002, comparing deployment costs to benefits. The analysis concluded that the current deployment process had three major shortfalls — it's labor intensive, lacks consistency and lacks proactive features such as notification of expiring qualification.

## An antiquated system

The old multi-step process required AFMC deployment managers to organize an airman's equipment and hospital records, schedule training and maintain personnel and other documents before the individual was considered deployable. "Many reported they used paper, spreadsheets and locally developed databases that differ from unit to unit within AFMC," said Col. Saunders.

"Deployment managers resorted to using personal computer-based tools to assist them, which has created duplicated databas-



*Staff Sgt. Daniel Whidby, 78th Security Forces Squadron, Robins AFB, Ga., guards an Airborne Warning and Control System aircraft, while deployed to Incirlik Air Base, Turkey. Under a new program being tested at Wright-Patterson AFB, Ohio, and Eglin AFB, Fla., warfighters, such as Sgt. Whidby, will be able to receive instant access to deployment information. (WR-ALC Public Affairs photo)*

es unable to interact with each other," Maj. Stephan said.

Gen. John Jumper, Air Force Chief of Staff, asked commanders to review their command's deployment readiness regularly.

"This fragmented data make the task challenging and leaves service providers unable to accurately predict demand in training and immunizations for upcoming AEF windows," Maj. Stephan said.

"The benefits of switching to DQS will allow deployment managers to focus on their primary areas of responsibility," said Tech. Sgt. Patricia Gilmore of Aeronautical Systems Center contracting. Since deployment manager is not a career field, the role is filled as an additional duty, with larger units dedicating one or two people full time to handle deployment responsibilities.

"The DQS allows deployment managers to immediately track individuals, no shows, training completion notices and any changes in training," she said.

## Service providers in the system

According to Maj. Stephan, the system also gives training providers a tool that can facilitate event scheduling, up-to-the-minute training rosters, an automated method to certify course completion, publishing training materials and compare planned training versus forecasted demand.

"This system will put more hours back in mission accomplishment and less in tracking," Sgt. Gilmore said. "The system will be faster than people can do paper work."

"We don't have to reinvent the wheel," she said. "This isn't rocket science; after all, this isn't even a concept that is new. We are taking a commercial process and making it fit the needs of the Air Force."

System testing was completed in March, with end user training performed at Wright-Patterson and Eglin AFB, Fla., said 2nd Lt. James Yeates, DQS program test director. "Users are asked to provide feedback to help shape the next configuration of the tool," he said.

The new system will be available for warfighter use to prepare for summer 2003 deployments.

— 2nd Lt. Shawn Fry, AFMC Public Affairs

# Partnership principles help AFMC deliver support to the warfighter

**Gen. Lester Lyles**  
AFMC commander  
&  
**Mr. Bobby Harnage**  
AFGE president

**E**very successful organization has key ingredients — strong leadership, dedicated workers, a clear roadmap of where it wants to go and focused goals. But there is another ingredient that strengthens an organization — strong partnerships.

Air Force Materiel Command and the American Federation of Government Employees, AFL-CIO, have forged a strong, dynamic partnership built on an important vision — labor and management working together to create and sustain an environment that takes care of our people so they can take care of the mission. And our partnership is helping us make a difference as we provide support to our American warfighters and our allies.

## Building on principles

But there was a time when our union and AFMC management did not have a strong partnership and we often engaged in heated debate about how best to serve the command workforce. But today, our relationship is built on five partnership principles:

- ❑ *We value and respect all workers*
- ❑ *We focus on our common interests and shared problems*
- ❑ *We share information freely*
- ❑ *We treat each other as equals*
- ❑ *And we work to sustain the partnership process*

We follow these principles with respect and appreciation for each other's roles



*The partnership between Air Force Materiel Command and the American Federation of Government Employees, AFL-CIO, is helping to make a difference as we provide support to our American warfighters, according to both Gen. Lester Lyles, AFMC commander, and Mr. Bobby Harnage, AFGE president. (Air Force photo by Master Sgt. Lance Chueng)*

and responsibilities. It's not a perfect partnership, few partnerships are. But we are committed to maintaining a climate in which management and the union work together. Whether it's on the shop floor or around the conference room table, we must work together as partners.

## The right thing to do

Following these principles is the right thing to do.

We've come a long way since we formed our command partnership council three years ago. Our councils, both at the headquarters and our centers, are making great strides as we operationalize partnership principles at all levels throughout AFMC.

## Working as a team

We are working as a team and there is no better example of our success than the Alternative Dispute Resolution program we're rolling out right now. It's a way to resolve disputes — not as adversaries — but as partners. It's quicker and less expensive than the traditional complaint process, so it puts less strain on our ability to accomplish the mission.

We call on everyone in AFMC, military and civilian, union and non-bargaining, to work as a team and embrace our partnership principles. It will make a difference in your quality of life and in AFMC's success meeting our national security objectives. Together we can make it happen.





# Strategic Sourcing: Improving supply chain performance

**Gen. Lester Lyles**  
AFMC commander

The demands on our supply chain have never been greater. From Desert Shield and Desert Storm to Operation Allied Force to Enduring Freedom, our mission to provide world class sustainment support to the warfighter remains unchanged.

What has changed in this age of Air Force transformation is the availability of new thinking to help us address critical supply chain integration. Strategic sourcing is one of the most significant and exciting examples of how we are leveraging our business to improve supply chain performance.

Though new to the Air Force, strategic sourcing is well known in the private sector and has helped many Fortune 500 companies dramatically improve their supply chain performance. Our AFMC strategic sourcing team has been visiting many of these companies.

Based on what the team saw as “best in breed” in industry and “best in practice” from Air Force organizations, they produced the following definition of strategic sourcing to support our mission: developing comprehensive supplier relationships through a disciplined, systematic process of effectively sourcing materials, products, and services to make the supply chain more effective and efficient in support of the warfighter.

## A new focus

So how will strategic sourcing improve our supply chain management? It helps AFMC to see suppliers in a different light and enables us to focus on improving supplier relationships.

Strategic sourcing stresses the importance of being better customers through increased collaboration and information sharing with our manufacturers and suppliers. AFMC has tied strategic sourcing to our logistics and contracting long-term business strategy.

The cornerstone of this strategy is long-term business arrangements with key suppliers who provide critical, high value, high-risk items.

## Striking a balance

Strategic sourcing strikes a balance between the two elements of risk-readiness, for example: mission capability; backorders; customer wait time and value. Other examples are the spend and sales revenue that we use to help set sustainment priorities.

As we begin to use strategic sourcing, we are going to focus our attention on critical items. These items, which are high risk and high value, account for more than 75 percent of the \$4 billion spend and readiness drivers affecting weapon system availability.

The AFMC team developed a five step process to implement strategic sourcing across the command. These five steps are a template for selecting, integrating and managing key suppliers through collaborative forecasting and planning, market research, performance measurements and improvement, strategy development and execution of long-term business arrangements to meet mission requirements.

## Spend analysis

The first step is spend analysis where we determine how much we spend each year, who is doing the buying, what we are buying and from whom we’re buying it.

Once we have this data in hand, we can rank our suppliers and look for opportunities to consolidate requirements. We’ll also bump this information against WSA targets to see where we can concentrate our efforts to greatest effect.

Internal requirements analysis is the second step of strategic sourcing, and here we examine what we’re currently buying in greater detail. We analyze cycle times, how the item is performing in the field and any special item or performance characteristics. We ask item managers and equipment specialists which items are impacting warfighter support.

In the third step, external market analysis, we review supplier performance. Since in the preceding steps we identified certain sole source suppliers who might make good candidates for long-term relationships, here we will check their performance.

We’ll contact the Defense Contract Management Agency and the Defense Contract Audit Agency for information about a supplier’s performance and financial health. If we’re dealing with a competitive item we could end up looking at many suppliers, and may have to search the marketplace for alternative sources.

## The best arrangement

In commodity strategy development, the fourth step, we determine what business arrangement is best for any given commodity. We look for an arrangement which ensures we can hold our supplier accountable and reward superior performance.

Finally, in step five, commodity strategy execution, we carry out our strategy, monitoring it as it unfolds and making adjustments as necessary.

There is no denying that strategic sourcing promises advantages to both the Air Force and suppliers. Perhaps most significantly, the Air Force is able to reduce cycle times through the co-forecasting that is an important part of strategic sourcing and long-term business relationships. In co-forecasting, our suppliers can start the manufacturing process before the order arrives, resulting in earlier delivery. Other advantages to the Air Force we expect to see include price stability, increased quality and improved reliability.

On the suppliers’ side, strategic sourcing allows the supplier to become more efficient thanks to the long-term business relationship. Through co-forecasting the supplier can better plan production, eliminate waste, lower costs and improve profitability.

## Success stories

Strategic sourcing is much more than just a theory; it’s already producing benefits to AFMC and the warfighter. At Tinker Air Force Base, Okla., Oklahoma City Air Logistics Center’s strategically sourced contracts with both General Electric and Pratt & Whitney, in support of aircraft engines, has reduced their administrative lead-times from six months to twenty-five days.

In 2001, Warner Robins ALC at Robins AFB, Ga., entered an eight-year strategically sourced contract with Boeing. As a result, ordering lead-times have dropped from 125 days to 4 days.

Also, Ogden ALC at Hill AFB, Utah, is using strategic sourcing to acquire aircraft tires from Goodyear and Michelin resulting in a 98 percent on-time delivery rate for aircraft tires and a reduction in inventories as well.

Finally, the command has committed to long-term arrangements with other industry partners and considering several additional long-term opportunities.

## Continuing support

Strategic sourcing is very promising and its potential is untapped. As we continue to aggressively and simultaneously support the war on terrorism and pursue Air Force transformation initiatives, we must continue to look for ways to improve our support of the weapon systems that are vital to our warfighters.

Strategic sourcing provides one answer to improving the management of the supply chain in our mission as warfighters supporting warfighters!

# Tinker military dog laid to rest with honors

In solemn procession they came, two by two, pausing a moment before the small white casket topped with red and white flowers to offer salutes of hands and waving tails.

It was a farewell befitting Ringo, a Belgian Malinois, that gave nearly 11 of his 13 years to the 72nd Security Forces Squadron at Tinker Air Force Base, Okla., and 10 months to his “retirement” home with the family of Del City patrolman Loyd Berger.

Ringo retired from duties as a military working dog March 31, 2002, and on July 23 was one of two veteran canines to receive the Air Force Commendation Medal for Meritorious Service. His retirement was featured in the October 2002 *Leading Edge*. He died Feb. 4 and the Tinker Honor Guard laid him to rest with military honors six days later.

“I was his handler a little over a year,” Staff Sgt. Joel Seal said. “Of all my dogs, Ringo was my favorite,” Sgt. Seal said. “He was very loyal, always willing to please. Wind, snow, rain — he was very eager to go to work at all times. We work for a paycheck; he worked for his toys.”

Sgt. Seal said Ringo, almost 13, was “getting to the point he was nondeployable” when he was retired. Once, dogs like Ringo were euthanized when their military days came to an end, but regulations now allow ownership transfer to their handlers or, as in Ringo’s case, to a local police department.

Ringo left the only home he’d ever known — the military working dog kennels at Tinker — for the luxury of family life April 15, 2002.

In his twilight months, Ringo discovered the joys of having his own toys and bed, and such taste-tempting delights as Popsicles and peanut butter treats. But he was also ready to go on patrol and perhaps sniff out some narcotics, according to Officer Berger.

Ringo was active and playful until a few days before his death. When the Bergers noticed he was ill, they took him to a veterinarian who diagnosed him with cancer.

Ringo left a legacy in both the Air Force and civilian worlds.

— Ms. Jeanne Grimes, OC-ALC Public Affairs

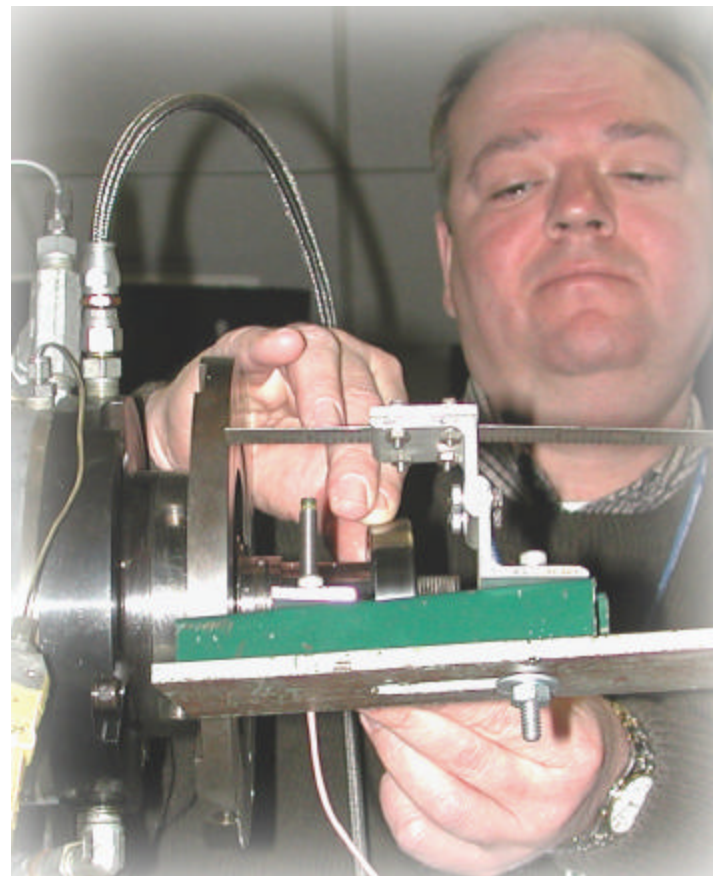


Senior Airman Jeff Wallace, with his working dog Marco, snaps a last salute for retired TinkerAFB, Okla., military working dog Ringo, during his funeral complete with honors by the Tinker Honor Guard. Tinker’s military working dog teams and local law enforcement agencies joined Ringo’s last partner, Del City patrolman Loyd Berger, far left, and family for the Feb. 10 service. (OC-ALC photo)



# Engineer follows path to education, success

*Air Force a 'great place for opportunity'*



*Dr. Nelson Forster, lead engineer for the research and development of all types of mechanical and lubrications systems hardware at the AFRL Propulsion Directorate, Wright-Patterson AFB, Ohio, followed a career path that led him to be considered the Defense Department's leading expert in this field. (Courtesy photo)*

More than 25 years ago he set off on the path of opportunity he imagined lay before him in the Air Force's scientific and engineering communities. Today, with doctorate, master's and bachelor's degrees hanging on his wall, five patents to his credit and four more patents pending, Dr. Nelson Forster is as humble as he is accomplished.

The senior mechanical engineer, who got his start in the research business as a Sinclair Community College cooperative education student in 1978, only hopes that more young people will follow in his footsteps as the Air Force faces a critical shortage of scientists and engineers like himself.

## Following a path

"I wanted to get a job as a draftsman but one thing led to another and I just followed where that path led me," explained the Dayton native. Fortunately for the Air Force Research Laboratory, that path brought him to the propulsion directorate where he worked as a young engineering technician conducting experimental tests on lubricants and gas turbine engine mechanical systems. He's been there ever since.

"The Air Force is a great place for opportunity. I simply took advantage of the opportunities available to me at the time," said Dr. Forster. Opportunities, he explained, that included all the education he was interested in receiving and the freedom to experiment and explore his own boundaries of discovery.

Along the way, the Sinclair, Wright State University and University of Dayton alumni racked up the coursework to complete his undergraduate, graduate and doctoral degrees, primarily going to school at night. Many, many nights, he said.

"Essentially I went to school at night from the time I was 20 until I was 40," he explained. "It took a long time and there weren't a lot of breaks along the way, but the opportunities here in the lab were tremendous."

Two of those opportunities were going for Air Force-funded long-term, full-time training. "The Air Force sent me to finish my senior year at Wright State in 1983-84, and again in 1992-93 to complete the course work for my Ph.D. There aren't many outside organizations that provide that kind of opportunity to their employees," he said.

## An aggressive approach

A quick look at his curriculum vitae, or resume, reveals Dr. Forster didn't just follow the opportunities as much as he lassoed them, hog-tied them and branded them like some mad cowboy scientist. His list of successes, awards and accomplishments fill multiple pages, yet despite the honors, Dr. Forster retains a certain amount of pure wonder at his ability to push the envelope of discovery.

"The opportunities here in the laboratory at Wright-Patterson are better than any where else I'm aware of, in industry or academia," he said. "I like every aspect of this work."

His enthusiasm is evident in his work.

He is considered the Defense Department's leading expert in the development of all types of mechanical and lubrications systems hardware and acts as the lead engineer for the research and development of these systems in gas turbine engines, said Dr.

Alan Garscadden, the propulsion directorate's chief scientist.

## An award winner

He is also one of only a handful of Air Force engineers to receive the Harold Brown Award — the highest Air Force award for applying engineering science to a field related problem.

His work developing corrosion-resistant materials for engine mechanical systems was noted by former Secretary of the Air Force and Secretary of Defense Harold Brown. Bearing corrosion is the leading cause of bearing rejection and failure in military engines and his work laid the cornerstone to solving this costly problem.

"One of his most significant accomplishments is his work leading the discovery, development and deployment of a process to manufacture 'carbon-carbon' bearing cages in advanced turbine engines, air vehicles and missiles. This new material and his use of it in engine bearing cages far exceed current engine operational capabilities," Dr. Garscadden pointed out.

"These cages, to which he holds the patent, are light, generate less heat, provide low friction and exhibit essentially no wear compared to traditional metal bearing cages that melt, char, burn or seize under similar conditions," he said.

Development of these high-speed bearings operating beyond the temperature limits of conventional synthetic liquid lubricants has been a research objective for more than 40 years. The breakthrough promises to lighten engine weight, improve engine performance and reduce the engine cost, Dr. Garscadden noted.

Testing of these carbon-carbon cages also indicates they can extend the life of engine bearing cages up to 10 times.

In addition to providing support to the warfighter, Dr. Forster believes the payoff of his work is both professional and personal. "One of the most rewarding parts of my job is having the

ability to change the outcome of experiments and see them end up in a successful product," he explained. "We're developing critical core technologies that are already distributed among many engine companies."

## Looking towards the future

But perhaps just as important to Dr. Forster as creating new technologies that support America's warfighters, is the need to develop the next generation of scientists and engineers to carry on the work he has begun.

"We definitely need young engineers and we need to start training the next generation. The sky is the limit for these young co-ops and even summer interns. The opportunity is there just as it was for me," he said.

And it's an opportunity that Air Force Materiel Command officials believe needs to be exploited if the command is going to meet the challenges of the 21st century.

Ms. Polly Sweet, AFMC's personnel management and workforce shaping chief, said in the next five to seven years the command, which employs the lion's share of Air Force scientists and engineers, will need to recruit more than 3,000 civilian engineers to keep America's warfighters on the cutting edge of technology.

No where is this more critical than in the command's research and development efforts led by AFRL, which is tasked with leading the discovery, development and integration of affordable warfighting technologies for the air and space force.

According to Ms. Sweet, their workforce shaping goal is to get scientists and engineers emerging from colleges and universities interested in considering internship and developmental positions in the labs, depots and program offices, much like Dr. Forster did when he was a community college student.

— Mr. Michael Kelly, AFRL Propulsion Directorate

# Innovation pays Tinker man in more ways than one

Innovation has paid off — not once, but four times for one 552nd Air Control Wing member at Tinker Air Force Base, Okla.

Since his arrival in the wing approximately four years ago, Staff Sgt. Daniel McSwain, an avionics test station and aircraft component specialist in the 552nd Component Maintenance Squadron's Avionics Intermediate Section, has continually looked for ways to improve processes in his shop.

He has submitted five suggestions for process improvements through the Air Force IDEA Program over the past four years, saving the Air Force money and earning him more than \$15,000 in awards.

His most recent award of \$10,000 was for adding a note to the technical order informing technicians that while testing

and repairing the compass adapter compensator, the illumination of the autopilot decoupled lamp on the test set may not be noticeable.

Technicians in the avionics intermediate section are responsible for repairing aircraft line replaceable units that are removed from aircraft on the flightline and brought to the designated backshop for troubleshooting and repair.

The staff sergeant's most recent suggestion added a note to the technical order letting technicians know the autopilot decoupled lamp may not illuminate during testing, or that it may illuminate so fast they would not notice it, helping to ensure every possible step was taken before the component was sent out as non-serviceable.

Since this suggestion has been added,

the Air Force has saved more than \$120,000 and more than 220 man-hours in trouble-shooting and needless repairs.

When asked about the award money, he said, "The first three awards went toward furthering my education, and this most recent award is going to savings."

"It's not really about the money, though," the sergeant said. "It's really about taking the initiative to try to improve and fix as much as we can, as opposed to just plugging the components into the testing system and declaring it as non-serviceable without taking extra steps to ensure that it is actually non-serviceable."

"It's about saving the Air Force money and making our jobs easier. The money is an added bonus."

— Ms. Bonita Dobbs, 552nd Air Control Wing Public Affairs



# Values, toughness prepare kids for life

**Airman 1st Class Micah Garbarino**  
Hill AFB, Utah, Public Affairs

“Okay Durke, if you want to play around on me you can do some push-ups,” said the karate teacher. “Give me ten. Right now.” Durke Kilburn is 5. It sounds like basic training, but there is no malice in Ms. Gloria Olson’s voice. She is tough, but as she chides the children one can hear concern and desire for the children to do better. Seeing the kids progress and build confidence is her favorite part of teaching karate, she said. “Tough love, it’s called, and the stereotypical karate teacher, Mr. Miyagi, would approve,” she said.

Ms. Olson is a sixth-degree black-belt who doesn’t believe in playing around, violence or bragging. She does believe in focus, self-defense and self-esteem. All of which can be earned through the art of karate, and according to her, for 12 years she has been teaching karate classes from 5-6 p.m. Monday and Wednesday at Hill Air Force Base, Utah, where children as young as 5-year-old Wesley Johnson can participate.

### Friends learn together

Five-year-old Wesley Johnson joined the class because his older brother, Elias, takes karate lessons from Ms. Olson.

“I started karate because I thought it would be fun and my best friend did it,” said 7-year-old Elias Johnson, who learns more than punches and kicks in Ms. Olson’s karate class.

“She tells us never to do karate at school because we could hurt someone and we could get into trouble,” he said. “She makes us say our motto after every class, ‘Loyalty to my God, my instructor, my school and my art. To always strive for what is good and not what is evil.’”

The children also learn about their drive and desire. Ms.

Olson can spot quitters quickly. “I can tell the difference between a kid who wants to be there, a kid who doesn’t and a violent kid who just wants to learn to kick and punch. They never last long,” she said. To her, karate is so much more than violence or kicks, jumps and punches. It is a tool for growth. “Children’s lives change every month, every week and every day, but karate doesn’t,” she said. “It has structure and rules. It is a way to learn about yourself. If you train yourself in something when you are young it will always be with you. You will be focused.”

Karate has been a part of her life for 17 years and it has affected all parts of her and her family’s lives. “My daughter Crystal is a cheerleader now, and people ask her how she became so limber and so focused. She tells them karate did that for her,” said Ms. Olson. “It is a way of life for me, and I think if you talk to black-belts, most will say the same thing.”

### Violence is not the answer

Parents may fear their children will develop a Bruce Lee complex if they take karate, and run around starting fights at school. But, if they do, it is against Ms. Olson’s wishes.

“When they want to fight, they want to fight and they don’t listen. I tell them to take it easy, violence will get you no where,” she said. “I tell them not to start fights, not to brag, not to tell kids they take karate and not to tell them what belt they have. Why would they? So they can feel big? One of these days someone will challenge them, and there is always someone bigger.”

While she warns against aggression, she strongly believes in defending oneself. “Nothing good comes from violence, but nobody has the right to push you around, kick you around or slap your face around. God gave you this body, it is the only one you have and no one has the right to abuse it.”

It is this reserved toughness that the children will learn from Ms. Olson. She teaches them not only through karate itself, but also through her attitude, the way she carries herself, her teaching style and a little discipline.



*Confused about which foot he should kick with, 5-year-old Durke Kilburn, left and center, gets some one on one instruction from Ms. Gloria Olson, who teaches karate at Hill AFB, Utah. Right: The karate teacher displays a proper fighting stance to 5-year-old Wesley Johnson. (Photos by Airman 1st Class Micah Garbarino, OO-ALC Public Affairs)*



# Botanist helps customers ‘turn over a new leaf’

“Everything is certainly not coming up roses” for an Air Force botanist whose sage advice to customers worldwide is helping them uproot troublesome plants while preserving native species beneficial to the environment. Trying to help Air Force bases avoid the destructiveness of “Little Shop of Horrors-type” scenarios where “alien” species run amuck is part of Ms. Mary Anderson’s grass roots efforts to convince clients to “turn over a new leaf” by adopting better conservationist attitudes.

“I provide technical support in-house to bases worldwide,” said Ms. Anderson, Air Force Center for Environmental Excellence botanist at Brooks City-Base, Texas. One of her biggest concerns is protecting the many endangered plant species that exist on Air Force installations. “It’s frustrating to me to hear people say, ‘we can’t do what we want because of endangered species.’ We can do just about anything we want so long as we time our actions.” In botany’s world, timing is critically important to plant survival.

### Educating leaders

Ms. Anderson educates leaders through environmental assessments that help make informed decisions about using sensitive habitats to fulfill mission requirements. “The loss of habitat is critical. We have to fulfill our missions, but there are things that we can do to lessen the impact on the environment,” she said.

Humanity’s footprint within ecosystems can be somewhat camouflaged by following her guidance concerning flowering plants, especially ones that are rare. “Once the plants have gone to seed, it’s okay,” she said about using sites where endangered species are no longer in blossoming.

Besides preventing the extinction of rare species, Air Force leaders who adhere to the botanist community’s advice are also preserving important scientific data. Referring to an endangered plant discovered at the Air Force Space Surveillance Complex on the Hawaiian island of Maui, Ms. Anderson said, “It’s an indicator species of the health of the entire ecosystem.”

She estimates there are about 100 rare plant species that exist on Air Force bases worldwide. She said plant management is key to their survival.

### Destruction can be reversed

For the most part, Air Force flora conservationism is being supported. “A lot of bases are concerned with the destruction of habitat caused mostly through construction activities,” she said. Habitat destruction can be reversed. An example of this involves the restoration of an endangered species at Travis AFB, Calif. “They have an endangered contra costa goldfields plant that lives in vernal pools. These pools are filled with this plant in the airfield areas and open spaces of the base,” she said. Heavy equipment use severely damaged the pools. Her recommendation to create new pools seeded with the endangered species is part of a five-year recovery plan to restore the habitat.

Sometimes military missions can enhance native species populations. Such is the case at Nellis AFB, Nev., where a species nearly disappeared because of decreased human activity. “Years



*Ms. Mary Anderson, an Air Force botanist at Brooks City-Base, Texas, examines a native species for insect infestation. (Photo by Mr. Rudy Purificato, 311th HSW)*

ago, the commander at the time decided to stop using the range to protect endangered plants,” she said. The move backfired when the species eventually disappeared. Finding no reason to protect plants that no longer existed on the range, a new commander ordered live fire activities to resume, and the species returned. “The endangered plants are fire-dependent,” she said.

Native species survival is another of her priorities. The primary enemy of native plants are invasive exotic species that Ms. Anderson helps Air Force leaders control through recommendations aimed at protecting bases’ natural resources.

The introduction of exotic plants can devastate native habitat and pose a significant danger to people. At Vandenburg AFB, Calif., non-native pampas grass is out-competing native plant communities in ecologically sensitive coastal dune areas, and is creating a fire hazard because the area is so dry, she said.

### Important natural resources

Ms. Anderson also promotes wetland conservation at bases as a natural resource that benefits mankind. “Wetlands are very important for cleaning filtering ground and surface water, and they’re flood control and as a habitat for plants and animals.” Ms. Anderson believes that everyone has a responsibility for helping protect and preserve our environment. While she “never promises anybody a rose garden,” she is always available to help customers resolve “thorny situations.”

— Mr. Rudy Purificato, 311th HSW



# AFMC cleans up with four environmental excellence awards

## Tinker environmental team best program in Air Force

TINKER AIR FORCE BASE, Okla. — Hard work and innovative thinking are credited with making Tinker's environmental management program the best in the Air Force.

Air Force officials selected the directorate staff as the industrial category's Gen. Thomas D. White Environmental Quality Award winner for 2002.

Unlike most environmental awards that look at very specific subprograms, the quality award measures the environmental management program's overall success during a two-year period.

One of those programs is working to find better, more environmentally friendly processes on the production line including

*Programs controller Mr. Al Howard programs the equipment at Tinker AFB, Okla., to strip paint from a KC-135 outboard wing flap using water instead of chemicals. Last year 886 aircraft parts went through the process where water shoots out at 26,000 pounds per square inch to blast away the paint. (Photo by Ms. Margo Wright OC-ALC Public Affairs)*



high-pressure water stripping, according to Mr. Freddie Hall, a chemical engineer at Tinker.

"The process uses a robotic arm to direct jets of water at the speed of sound to blast old paint from aircraft parts," he said. "It not only reduces labor time, but it significantly reduces the amount of hazardous chemicals in our waste stream."

— Reported by OC-ALC Public Affairs

## Robins has a winning pollution prevention team

ROBINS AIR FORCE BASE, Ga. — As the winners of four Defense Department pollution prevention awards since 1994, the Environmental Management pollution prevention team here recently won the 2002 Gen. Thomas D. White Environmental Award for team excellence.

This award, which is presented to installations with outstanding pollution-prevention programs, emphasized the team's use of Lean principals to continue its high level of environmental awareness.

One of the processes that helped to put the Robins team over the top in the Air Force competition is the FlashJet depainting system. FlashJet depainting generates high intensity energy from a xenon flash lamp which heats up the paint on aircraft parts. The energy turns the paint into ash, while carbon dioxide pellets clean the surface and keep it cool.

The process reduces the waste stream to nearly nothing compared to traditional chemical or plastic media paint stripping operations. The process also has a projected annual savings of \$900,000, and reduction of toxic waste.

— Reported by WR-ALC Public Affairs

## Hill wins the environmental excellence Air Force award

HILL AIR FORCE BASE, Utah — Hill's environmental team captured the Air Force's Restoration Award for environmental excellence recognizing the best cleanup effort of former pollution and waste disposal practices.

The award represents Hill's efforts from October 2000 to September 2002 to clean up more than 100 sites where hazardous wastes had been dumped over the base's 60-year history.

Building trust as a good neighbor, Hill has treated 56.6 million gallons of contaminated ground water, teamed with the community and used innovative technologies and flexible contracts saved substantial tax dollars by completing multiple tasks well ahead of schedule.

— Reported by OO-ALC Public Affairs

## Eglin awarded pollution prevention excellence

EGLIN AIR FORCE BASE, Fla. — Once again, the pollution prevention branch of the Air Armament Center Environmental Management Directorate swept up the Air Force Gen. Thomas D. White Pollution Prevention Award.

The branch previously won the award in 2000, which noted its development of a base compliance site inventory ranking system.

Eglin's 2,000 plus compliance sites are tracked by a program ranking each site by potential environmental, health, safety and mission impact risks.

The branch successfully partnered with the Air Force Materiel Command and internal organizations to convert all non-emergency, non-tactical Eglin diesel-fueled vehicles to biodiesel. Biodiesel is an agricultural based alternative fuel that decreases air emissions.

By having a proactive recycling program the base was able to divert 50 percent of its waste from the local landfill.

In addition, the recycling program which services 347 buildings daily, saved \$2.75 million by recycling used oil, used oil filters, fluorescent and high intensity light devices and plastic media.

— Reported by AAC Public Affairs

## Edwards aerial photographer wins honors in national photo contest

EDWARDS AIR FORCE BASE, Calif. — An Edwards aerial photographer took first place in the military division in the annual Aviation Week and Space Technology photo contest. Ms. Bobbi Garcia, who works for Rohmann Services in support of the Air Force Flight Test Center here, took the winning photo of a B-2 completing a mission over the Pacific Ocean, which appeared in the December 30th issue.

According to Ms. Garcia, the award caught her by surprise.

"We're here to support the Air Force Flight Test Center and the odds of being in a position for this kind of shot was amazing," she said.

Ms. Garcia shot the photo from the back of an F-16 flown by Maj. Ed "Bernie" Cassidy and credits him and his aircrew for putting her in a position to take the photograph.

"If you don't have an excellent aircrew, your shot is not going to be what it could be," said Ms. Garcia. "The aircrew that I work with are great because of their experience and abilities, and that makes my job a whole lot easier."

Ms. Garcia, who took her first flight at age four in her uncle's private aircraft, had been a freelance photographer since the early 1980s. She found her dream job when she dis-



Award winning photo by Ms. Bobbi Garcia, Edwards AFB, Calif.

covered that you could combine flying with photography.

Although her job may not come with the salary or benefits that a commercial company could provide, she takes satisfaction in supporting the military and helping her country.

"This is the job that I wanted all of my life," she said. "I wouldn't trade it for anything because I can go home at night and know that I have done something worthwhile for my country and that is what matters to me."

— Information provided AFFTC Public Affairs

## Eight recognized as modern-day leaders

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — Eight Air Force Materiel Command 2003 modern-day technology leaders were recognized during the 17th annual Black Engineer of the Year Awards Conference in February.

Dr. Emmanuel Boakeye, Mr. Archie Woods, Mr. Joseph Gordon, Mr. Roderic Perry, Mr. Jerome Wilson, Capt. Reginald Turner, all of Wright-Patterson, Capt. Anthony Walker of Edwards AFB, Calif, and Mr. Lloyd Reshard of Eglin AFB, Fla. were identified as "young up-and-comers in engineering, information technology or science, whose early career and personal accomplishments make them outstanding role models for other blacks who may aspire to follow them into these career fields," said Mr. Eric Addison, Black Engineer.com managing editor.

The awards were presented Feb. 15 during the 17th annual awards conference in Baltimore, Md., on behalf of the Council of Engineering Deans of the Historically Black Colleges and Universities, Lockheed Martin Corporation, DaimlerChrysler Corporation and U.S. Black Engineer &

Information Technology magazine. The event is held each year to promote diversity and encourage minorities in engineering and science.

— Reported by AFRL & AFMC Public Affairs

## Tiny clamp brings bonus for Tinker parts worker

TINKER AIR FORCE BASE, Okla. — Using a \$2 clamp to peel hours and frustration off F100 synchronizing ring repair time earned a propulsion aircraft mechanic here more than \$6,000 courtesy of the Innovative Development through Employee Awareness Program.

Mr. Robert Dennis, a propulsion aircraft mechanic re-worker, earned \$6,365 for recommending that maintainers use six squeezer clekos, or C-clamps, to hold linkage pin locks in place when assembling rear compressor synchronizing rings, an idea that is expected to save Tinker more than \$42,000.

IDEA, a program established in 1943, allows anyone from military members to civilian workers and private citizens to submit suggestions that save the government time or money or improve jobs or working conditions. In fiscal 2002, Tinker

employees collectively earned \$260,611 for suggestions that had tangible savings of more than \$5 million.

— Reported by OC-ALC Public Affairs

## Laboratory chief scientist wins 2002 Will Allis prize

WRIGHT-PATTERSON AFB, Ohio — Dr. Alan Garscadden, chief scientist for the Air Force Research Laboratory Propulsion Directorate here, recently won the 2002 Will Allis Prize for the study of ionized gases.

He was singled out for his distinguished career in gaseous electronics research and for his dedicated role as an advocate for the gaseous electronics field.

Dr. Garscadden serves as technical advisor on a wide spectrum of aeronautical research, including many facets of propulsion, aerospace power, hypersonics, laser physics, combustion and plasma phenomena and applications.

He is known for his work in theoretical and experimental basic and applied research in plasmas and energized gas flows, lasers, laser-based measurements and has authored more than 250 publications and presentations.

— Reported by AFRL Public Affairs